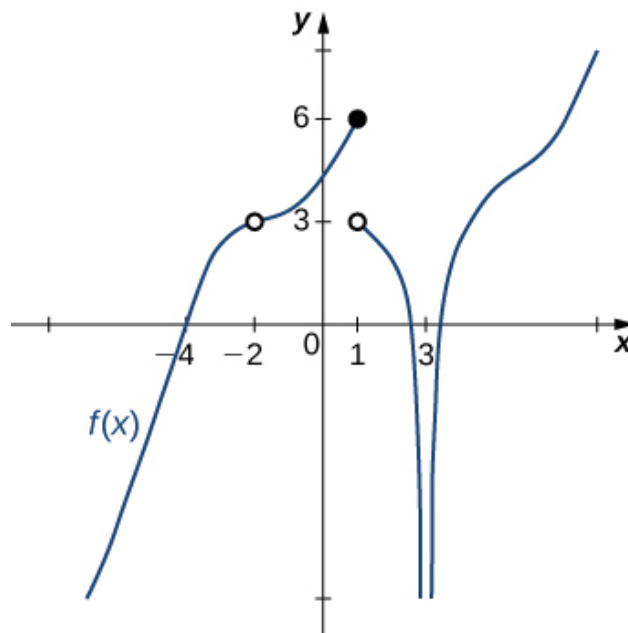


1. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x) = 3$ .



- A.  $-\infty$   
B.  $-2$   
C.  $1$   
D. Multiple  $a$  make the statement true.  
E. No  $a$  make the statement true.

- 
2. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 7} \frac{\sqrt{9x - 47} - 4}{5x - 35}$$

- A. 0.125  
B. 0.600  
C. 0.025  
D.  $\infty$   
E. None of the above

3. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow -3^-} \frac{3}{(x+3)^7} + 4$$

- A.  $f(-3)$
  - B.  $\infty$
  - C.  $-\infty$
  - D. The limit does not exist
  - E. None of the above
- 

4. To estimate the one-sided limit of the function below as  $x$  approaches 5 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{5}{x} - 1}{x - 5}$$

- A.  $\{4.9000, 4.9900, 5.0100, 5.1000\}$
  - B.  $\{5.0000, 4.9000, 4.9900, 4.9990\}$
  - C.  $\{4.9000, 4.9900, 4.9990, 4.9999\}$
  - D.  $\{5.0000, 5.1000, 5.0100, 5.0010\}$
  - E.  $\{5.1000, 5.0100, 5.0010, 5.0001\}$
- 

5. Based on the information below, which of the following statements is always true?

*As  $x$  approaches 4,  $f(x)$  approaches 3.047.*

- A.  $f(3)$  is close to or exactly 4
- B.  $f(4) = 3$
- C.  $f(4)$  is close to or exactly 3

- D.  $f(3) = 4$   
E. None of the above are always true.
- 

6. Based on the information below, which of the following statements is always true?

*$f(x)$  approaches 13.392 as  $x$  approaches  $\infty$ .*

- A.  $f(x)$  is close to or exactly  $\infty$  when  $x$  is large enough.  
B.  $f(x)$  is close to or exactly 13.392 when  $x$  is large enough.  
C.  $x$  is undefined when  $f(x)$  is large enough.  
D.  $f(x)$  is undefined when  $x$  is large enough.  
E. None of the above are always true.
- 

7. To estimate the one-sided limit of the function below as  $x$  approaches 6 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{6}{x} - 1}{x - 6}$$

- A.  $\{6.0000, 6.1000, 6.0100, 6.0010\}$   
B.  $\{6.0000, 5.9000, 5.9900, 5.9990\}$   
C.  $\{6.1000, 6.0100, 6.0010, 6.0001\}$   
D.  $\{5.9000, 5.9900, 6.0100, 6.1000\}$   
E.  $\{5.9000, 5.9900, 5.9990, 5.9999\}$
- 

8. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow -1^-} \frac{2}{(x+1)^3} + 7$$

- A.  $f(-1)$

- B.  $\infty$
- C.  $-\infty$
- D. The limit does not exist
- E. None of the above

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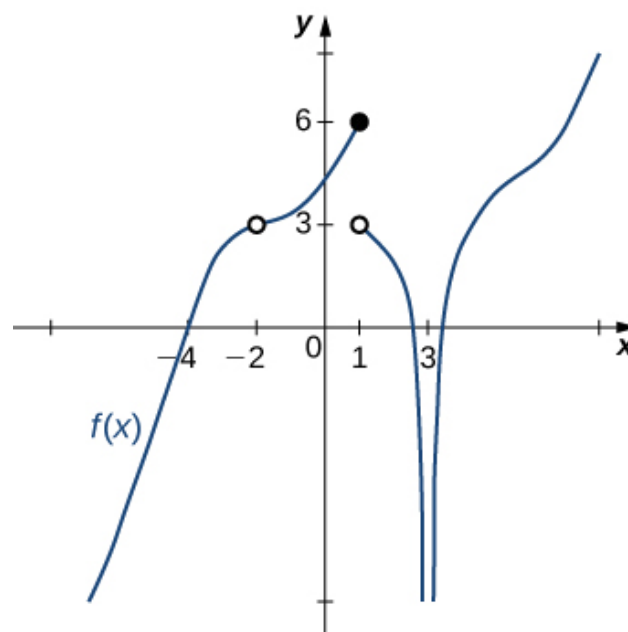
9. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 5} \frac{\sqrt{5x - 9} - 4}{7x - 35}$$

- A. 0.089
- B. 0.125
- C. 0.319
- D.  $\infty$
- E. None of the above

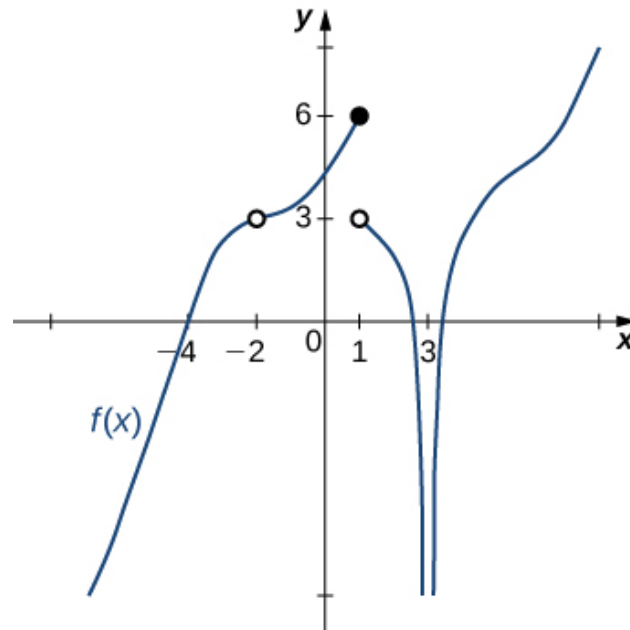
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10. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x)$  does not exist.



- A. 3
  - B. 1
  - C.  $-2$
  - D. Multiple  $a$  make the statement true.
  - E. No  $a$  make the statement true.
- 

11. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x)$  does not exist.



- A. 1
  - B.  $-2$
  - C. 3
  - D. Multiple  $a$  make the statement true.
  - E. No  $a$  make the statement true.
-

12. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 7} \frac{\sqrt{7x - 33} - 4}{2x - 14}$$

- A. 0.062
  - B. 1.323
  - C.  $\infty$
  - D. 0.125
  - E. None of the above
- 

13. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow -9^+} \frac{-2}{(x + 9)^6} + 3$$

- A.  $\infty$
  - B.  $f(-9)$
  - C.  $-\infty$
  - D. The limit does not exist
  - E. None of the above
- 

14. To estimate the one-sided limit of the function below as  $x$  approaches 4 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{4}{x} - 1}{x - 4}$$

- A.  $\{4.0000, 4.1000, 4.0100, 4.0010\}$
- B.  $\{4.0000, 3.9000, 3.9900, 3.9990\}$
- C.  $\{3.9000, 3.9900, 3.9990, 3.9999\}$
- D.  $\{4.1000, 4.0100, 4.0010, 4.0001\}$

E.  $\{3.9000, 3.9900, 4.0100, 4.1000\}$

---

15. Based on the information below, which of the following statements is always true?

*As  $x$  approaches  $\infty$ ,  $f(x)$  approaches 12.374.*

- A.  $x$  is undefined when  $f(x)$  is large enough.
  - B.  $f(x)$  is close to or exactly 12.374 when  $x$  is large enough.
  - C.  $f(x)$  is close to or exactly  $\infty$  when  $x$  is large enough.
  - D.  $f(x)$  is undefined when  $x$  is large enough.
  - E. None of the above are always true.
- 

16. Based on the information below, which of the following statements is always true?

*$f(x)$  approaches 18.962 as  $x$  approaches  $\infty$ .*

- A.  $f(x)$  is undefined when  $x$  is large enough.
  - B.  $f(x)$  is close to or exactly  $\infty$  when  $x$  is large enough.
  - C.  $f(x)$  is close to or exactly 18.962 when  $x$  is large enough.
  - D.  $x$  is undefined when  $f(x)$  is large enough.
  - E. None of the above are always true.
- 

17. To estimate the one-sided limit of the function below as  $x$  approaches 1 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{1}{x} - 1}{x - 1}$$

- A.  $\{1.0000, 0.9000, 0.9900, 0.9990\}$
- B.  $\{1.0000, 1.1000, 1.0100, 1.0010\}$
- C.  $\{0.9000, 0.9900, 0.9990, 0.9999\}$

D.  $\{1.1000, 1.0100, 1.0010, 1.0001\}$

E.  $\{0.9000, 0.9900, 1.0100, 1.1000\}$

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18. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow 5^+} \frac{-3}{(x+5)^7} + 2$$

A.  $\infty$

B.  $-\infty$

C.  $f(5)$

D. The limit does not exist

E. None of the above

---

19. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 5} \frac{\sqrt{9x-29}-4}{6x-30}$$

A.  $\infty$

B. 0.125

C. 0.021

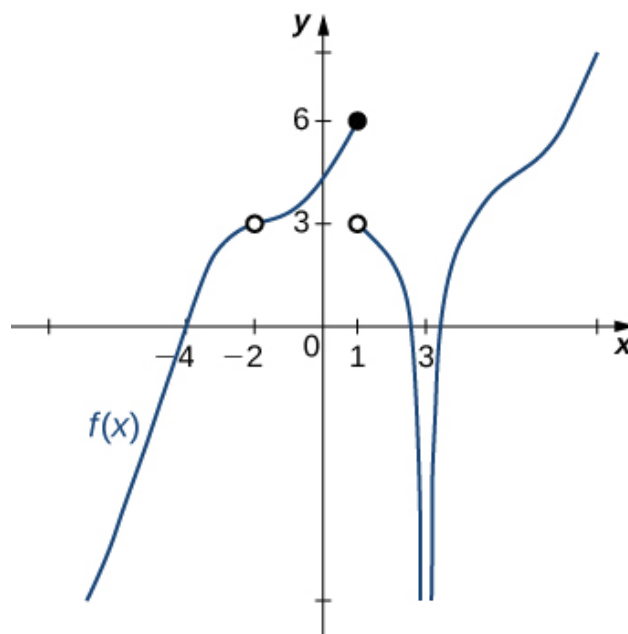
D. 0.500

E. None of the above

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20. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x) = 3$ .

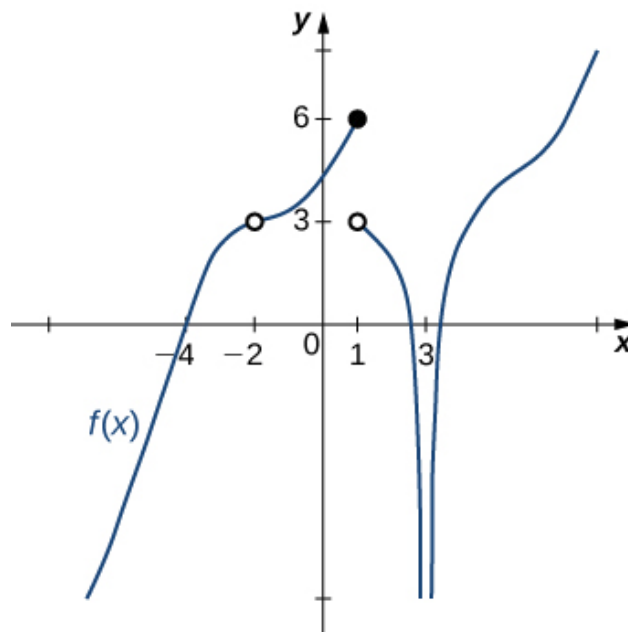




- A.  $-2$
- B.  $-\infty$
- C.  $1$
- D. Multiple  $a$  make the statement true.
- E. No  $a$  make the statement true.

---

21. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x) = 3$ .



- A.  $-2$
- B.  $1$
- C.  $-\infty$
- D. Multiple  $a$  make the statement true.
- E. No  $a$  make the statement true.

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22. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 9} \frac{\sqrt{7x - 14} - 7}{2x - 18}$$

- A.  $1.323$
- B.  $\infty$
- C.  $0.036$
- D.  $0.071$
- E. None of the above

23. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow 1^+} \frac{1}{(x-1)^8} + 4$$

- A.  $-\infty$
  - B.  $f(1)$
  - C.  $\infty$
  - D. The limit does not exist
  - E. None of the above
- 

24. To estimate the one-sided limit of the function below as  $x$  approaches 8 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{8}{x} - 1}{x - 8}$$

- A.  $\{7.9000, 7.9900, 8.0100, 8.1000\}$
  - B.  $\{8.1000, 8.0100, 8.0010, 8.0001\}$
  - C.  $\{7.9000, 7.9900, 7.9990, 7.9999\}$
  - D.  $\{8.0000, 7.9000, 7.9900, 7.9990\}$
  - E.  $\{8.0000, 8.1000, 8.0100, 8.0010\}$
- 

25. Based on the information below, which of the following statements is always true?

*As  $x$  approaches 9,  $f(x)$  approaches 7.206.*

- A.  $f(x) = 9$  when  $x$  is close to 7.206
- B.  $f(x) = 7.206$  when  $x$  is close to 9
- C.  $f(x)$  is close to or exactly 9 when  $x$  is close to 7.206
- D.  $f(x)$  is close to or exactly 7.206 when  $x$  is close to 9
- E. None of the above are always true.

26. Based on the information below, which of the following statements is always true?

*As  $x$  approaches 9,  $f(x)$  approaches 8.194.*

- A.  $f(8)$  is close to or exactly 9
  - B.  $f(9)$  is close to or exactly 8
  - C.  $f(9) = 8$
  - D.  $f(8) = 9$
  - E. None of the above are always true.
- 

27. To estimate the one-sided limit of the function below as  $x$  approaches 3 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{3}{x} - 1}{x - 3}$$

- A.  $\{2.9000, 2.9900, 3.0100, 3.1000\}$
  - B.  $\{3.0000, 2.9000, 2.9900, 2.9990\}$
  - C.  $\{3.1000, 3.0100, 3.0010, 3.0001\}$
  - D.  $\{3.0000, 3.1000, 3.0100, 3.0010\}$
  - E.  $\{2.9000, 2.9900, 2.9990, 2.9999\}$
- 

28. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow -1^-} \frac{8}{(x + 1)^5} + 1$$

- A.  $\infty$
- B.  $f(-1)$
- C.  $-\infty$
- D. The limit does not exist

E. None of the above

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29. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 8} \frac{\sqrt{3x - 8} - 4}{6x - 48}$$

A.  $\infty$

B. 0.021

C. 0.289

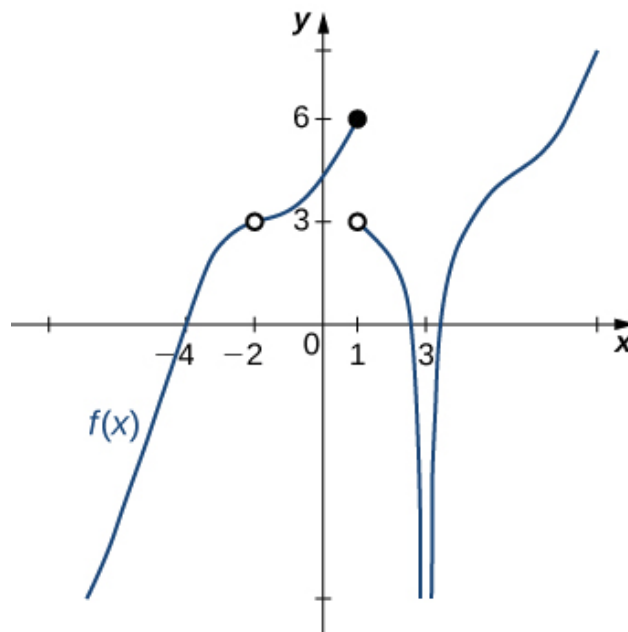
D. 0.125

E. None of the above

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30. For the graph below, find the value(s)  $a$  that makes the statement true:

$$\lim_{x \rightarrow a} f(x) = 0.$$



A. 3

B.  $-4$

C. 0

D. Multiple  $a$  make the statement true.

E. No  $a$  make the statement true.

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